

Stanford University
Departments of Mathematics and Statistics

PROBABILITY SEMINAR

4pm, Monday, February 11, 2019
Sequoia Hall Room 200

Refreshments served at 3:30pm in the Lounge.

Speaker: Kavita Ramanan, *Brown University*

Title: **Local Dynamics of Interacting Stochastic Processes
on Sparse Graphs**

Abstract:

We consider a large system of homogeneous interacting particles on a (possibly random) graph in which the infinitesimal evolution of each particle depends on its own state and the empirical measure of the states of neighboring particles. Such interacting particle systems arise in a variety of applications, ranging from engineering to physics. When the graph is complete, it is well known that the dynamics of a typical particle converges in the limit, as the number of vertices goes to infinity, to a so-called nonlinear Markov process, often referred to as the McKean–Vlasov or mean-field limit. In this talk, we focus on the complementary case of scaling limits of dynamics on sparse graphs, and obtain a novel characterization of the dynamics of a typical particle in the case when the limit interaction graph is a tree. The proofs rely on a certain Gibbs structure of the dynamics, which may be of independent interest.

This is based on joint works with Ankan Ganguly, Dan Lacker, and Ruoyu Wu.